



'We bring people to space — We bring space to people'

Director congratulates Center on ISO results

The Marshall Center has been recommended for continued registration to ISO 9001 by National Quality Assurance, following the recent surveillance audit.

Auditors found zero major non-conformances, one minor non-conformance, one observation and zero carryovers from the last surveillances.

"I would like to congratulate those of you who supported this highly successful effort that contributed to Marshall maintaining its ISO 9001 certification," said Sid Saucier, Marshall's associate director and ISO 9000 management representative. "Certification is most important to our Center. Each of you did an outstanding job in the preparation for the audit and those who were interviewed are to be commended.

"To maintain our certification and meet our NASA goal, auditors will return in February 2001 for the next surveillance audit and every 6 months thereafter," Saucier said.

"We are fortunate to have a team that takes our business processes seriously and works to live by them," said Center Director Art Stephenson. "I also am encouraged to hear that a number of process improvements have been suggested and are being addressed.

"As we have defined our processes, we are now in a great position to improve on them," Stephenson said. "Congratulations to everyone at Marshall, and a special thanks to our ISO leadership team and our internal auditors who keep us sharp. Our goal is to continually improve as we pursue excellence. We are on our way."

"Our Mission Depends on Safety"
— Safety slogan submitted by
Robin Flachbart, TD53

Students participate in first long-duration experiment for ISS

by Tracy McMahan

Students from middle and high schools across America are helping with the first long-duration experiment that astronauts will place aboard the International Space Station this month

when the Space Shuttle Atlantis heads back to the unique, orbiting laboratory.

The students have prepared about 150 of the 500 biological samples that the crew will transfer from the Shuttle to the Space Station during the STS-106 mission set for launch Friday.

As part of a NASA pilot education program, students have grown crystals in their classrooms and learned about

biological substances that carry out many important functions for humans, animals and plants.

"Involving students in the first Space Station experiment is a great way to teach

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Photo by Dennis Olive, NASA/Marshall Space Flight Center

Michelle Byrum, left, of Douglas High School in Marshall County loads a biological solution as Amanda Brownfield, right, of Bob Jones High School in Madison helps out. Samples will be frozen in the nitrogen dewar, in foreground. Amy Greenshaw, at rear left, of Hazel Green High School and Andrew Jones, rear right, of Bob Jones High School, prepare another sample.

More than 100 companies recognized for excellence in keeping Shuttle flying

by Jonathan Baggs

The Marshall Center is recognizing many of the companies that contribute to the success of the Space Shuttle — the workhorse of America's space program for nearly two decades.

More than 100 companies across the country are being recognized by NASA for their dedication to excellence in providing materials used in the Shuttle's Reusable

Solid Rocket Motors.

The motors provide 80 percent of the thrust during the first two minutes of a Shuttle flight, are the largest solid rocket motors in the world — and the only ones rated for human space travel. They have helped lift every Space Shuttle into orbit since the Shuttle program began in 1981.

Today, NASA is preparing for the 99th Shuttle flight, mission STS-106, targeted

See *Companies* on page 7

Marshall researchers build magnetic field in test lab to evaluate plasma propulsion

by Debra Valine

Marshall researchers recently conducted the first of two test sessions on the Mini-Magneto-spheric Plasma Propulsion Experiment — M2P2 — and results so far are favorable.

The experiment, which explores using solar wind as a propulsion system, may offer a practical method of propelling objects into the outer solar system. The next test session is to begin Sept. 11 in Marshall's Test Area 300 vacuum chamber.

The experiment has three objectives: demonstrate expansion of the magnetic field structure by filling it with cold — or low energy — plasma from the inside; observe artificial solar wind being deflected by this magnetic field; and measure the force of the artificial solar wind.

For this experiment, the researchers have created a magnetic field, filling it with low-energy plasma from the inside in an effort to recreate Earth's upper atmosphere.

In space, light from the Sun boils gas from the Earth's upper atmosphere, causing the ultraviolet light to separate electrons from the gas to form an electrically charged ionized gas or plasma. Those charged particles are trapped within Earth's magnetic field. As the gas is ionized — or charged — and leaves the Earth's atmosphere, it flows outward along magnetic field lines where it accumulates.

"The same thing happens with the M2P2," said Dr. Dennis Gallagher, a research scientist in Marshall's Science Directorate. "We are making an artificial magnetosphere that is filled from the inside with low-energy plasma."

He likened this propulsion concept to wind blowing on the sails of a sailboat. "The force from the wind makes the sailboat move across the water," Gallagher said. "Solar wind provides that same sort of force in space — at 1 million mph."



Photo by Dennis Olive, NASA/Marshall Space Flight Center

Winglee, left, and Gallagher, center, show how plasma inflates a magnetic field during the first testing session at Marshall. Ben Warrick Jr., right, of the University of Washington, looks on.

This experiment partners Marshall's Space Science Department and Propulsion Research Center; the Physics Department and the Propulsion Research Center at the University of Alabama in Huntsville; the University of Washington; and Marshall's test area personnel.

"Test area personnel are having to change their normal way of doing things," he said. "They are used to engineers bringing them a test article and the plan for testing it — and the engineers leaving it to be tested. We took our experiment and moved in there. We adjust the experiment as it progresses because we don't always know what result we will achieve. The test area personnel are doing a great job."

Dr. Robert Winglee, a professor at the University of Washington in Seattle, is promoting this propulsion concept. There it is being tested in a tabletop-size vacuum chamber. The test chamber at Marshall is a 20-foot-diameter by 35-foot-long heavy stainless steel cylinder.

"We were asked by Les Johnson, manager for in-space transportation technologies for Marshall's Advanced Space Transportation Program, to evaluate the concept here at Marshall," Gallagher said. "We decided the best way to really test this concept was to do it in a large vacuum chamber."

Because the chamber at Marshall is so much larger than that used at the University of Washington, adjustments had to be made to operate the experiment in the larger environment.

"During the first two-week session of testing, we had to figure out how to operate the experiment in our chamber and accomplish the first objective — demonstrate the expansion of the magnetic field when the structure is filled with low-energy plasma," Gallagher said.

"We used three digital cameras — two of the cameras were video cameras and one was a computer camera — to monitor the experiment because the chamber is

See M2P2 on page 7

Ann Whitaker named deputy director of Science Directorate

Dr. Ann F. Whitaker has been named deputy director of Marshall's Science Directorate.

Prior to this appointment, she served as manager of the Materials, Processes and Manufacturing Department in the Engineering Directorate.

Whitaker joined Marshall in 1963 as a materials engineer in the former Propulsion and Vehicle Engineering Laboratory. Since her appointment to the Senior Executive Service in 1995,

she has held positions of deputy director of the Space Sciences Laboratory in the Science and Engineering Directorate; director of the Materials and Processes Laboratory in the Science and Engineering Directorate; and manager of the Materials, Processes and Manufacturing Department in the Engineering Directorate.

Whitaker has received numerous awards and special recognition including the NASA Exceptional Engineering Achievement Award and the NASA Exceptional Service Medal. She holds a bachelor's degree from Berry College in Mount Berry, Ga., a master's degree in physics from the University of Alabama in Huntsville, and a doctorate in materials engineering from Auburn University. She is a 1994 graduate of the Senior Executive Service Candidate Development Program.



Whitaker

Girl Scouts seeking nominations for Women's Scroll of Honor

Madison County Girl Scouts are seeking nominations for their Women's Scroll of Honor. The Scroll of Honor — established by Girl Scouts of North Alabama Inc. — honors women who are active, ethical women who give of themselves to their community. The awards program is an extension of two of the basic aims of Girl Scouting: providing positive role models for girls and helping them relate to others with increased understanding of their importance as persons.

Categories for awards are:

- Outstanding Professional Woman Award
- Outstanding Volunteer Service Award
- Outstanding Educator Award
- Outstanding Young Woman Award (ages 19-35)
- Lifetime Achievement Award

The nomination fee is \$35 per nominee, which includes the dinner ticket for the nominee. Deadline for submitting nominations is Sept. 18. The dinner is Nov. 3 at the Beville Conference Center and Hotel in Huntsville. Additional dinner tickets may be purchased for \$25.

For more information, call Tracy Silas at 883-1020.

Upcoming Events

Ethics Training — Federal regulations require that each calendar year employees who are required to file public or confidential financial disclosure reports receive ethics training. This year, the training will be offered in an electronic format between Sept. 1 and Sept. 29. Employees who filed financial disclosure reports in calendar year 1999 will receive an e-mail message with instructions on how to access the training. Verbal briefings will be in October for those who prefer a live presentation. For more information, call Lonia Moore at 544-0023.

Pre-Retirement Planning — The Marshall Annual Pre-Retirement Planning Seminar will be 8:30 a.m. Sept. 12-14 in Morris Auditorium. Topics such as Social Security and Medicare, Financial Planning, Estate Planning, National Association of Retired Federal Employees, the Marshall Retirees Association and the Retirement Systems will be discussed. No form 59 is needed, just let your organization know that you are attending and sign the roster as you enter the auditorium.

History Video — As part of Marshall's 40th anniversary history series, a 25-minute video will be shown at 11 a.m. Friday in the Heritage Gallery in Bldg. 4203. The video features historical footage of President Eisenhower's arrival and dedication of the Marshall Center 40 years ago.

Job Opportunities

CPP-00-109-SC, AST, Structural Materials, GS-806-11, Potential to GS-13, Engineering Directorate, Materials, Processes & Manufacturing Department, Environments Effects Group. Closes Sept. 15.

CPP-00-118-CP, Financial Program Manager, GS-505-15, Office of Chief Financial Officer, Systems and Processes Office. Closes Sept. 11.

CPP-00-122-CP, AST, Aerospace Flight Systems, GS-861-14, Science Directorate, Science Systems Department, Experiment Definition & Development Group. Closes Sept. 11.

CPP-00-123-CL, Technical Requirements Support Assistant, GS-301-05, Potential to GS-11, Space Transportation Directorate, Advanced Concepts Department. Closes Sept. 13.

Reassignment Bulletin -00-31-CP, AST, Aerospace Flight Systems, GS-861-13 (2 vacancies), Science Directorate, Science Systems Department, Space Flight Experiments Group. Closes Sept. 18.

Reassignment Bulletin-00-34-CL, AST, Aerospace Flight Systems, GS-861-13, Space Transportation Directorate, Second Generation Reusable Launch Vehicle Program Office. Closes Sept. 18.

CPP-00-124-EB, AST, Navigation, Guidance and Control Systems, GS-861-14, Engineering Directorate, Avionics Department, Control Electronics Group. Closes Sept. 12.

CPP-00-113-DS, AST, Technical Management Systems, GS-801-14, Engineering Directorate, Business Management Office. Closes Sept. 18.

Eisenhower dedicated Center 40 years ago this week

The Marshall Center will celebrate its 40th anniversary Sept. 21. Listed below are some of the important events in Marshall's history.

July 1, 1960 — The Marshall Space Flight Center, a field installation of the National Aeronautics and Space Administration is activated in Huntsville with the transfer of buildings, land, space projects, property and personnel from the U.S. Army. Dr. Wernher von Braun became the Center's first director.

Sept. 8, 1960 — President Eisenhower visits Huntsville to dedicate the Marshall Center in honor of Gen. George C. Marshall, the Army chief of staff during World War II, secretary of state and Nobel Prize winner for his world-renowned "Marshall Plan."

May 5, 1961 — Marshall's Mercury-Redstone vehicle boosts America's first astronaut, Alan B. Shepard, on a suborbital flight.

May 25, 1961 — President Kennedy commits the United States to landing a human on the Moon, "before this decade is out." As a result, national attention focuses on the Marshall Center where von Braun's rocket team initiates an unprecedented research and development effort aimed at one objective — provide the launch vehicle that can take humans to the Moon.

June 1969 — The Marshall Center is assigned responsibility to develop a Lunar Roving Vehicle. Lunar Roving Vehicles or "moon buggies" were used on the last three Apollo lunar landing missions.

July 16, 1969 — In answer to President Kennedy's challenge, a mammoth Saturn V Moon rocket, developed by the Marshall Center, launches the Apollo 11 astronauts on their journey to the lunar surface.

May 14, 1973 — A Saturn V Moon rocket launches Marshall-led Skylab, the United States' first crewed orbiting space station.

July 1975 — A Saturn rocket is used to send American astronauts to rendezvous in space with Russian cosmonauts onboard a



File photo

President Eisenhower and Mrs. George C. Marshall unveil a bust of Gen. Marshall at Marshall Center's dedication ceremony Sept. 8, 1960. The bust is on permanent display in the Bldg. 4200 lobby.

Soyuz spacecraft.

Aug. 17, 1977 — The first of three High Energy Astronomical Observatories developed by the Marshall Center is launched. They will provide revolutionary insights into celestial objects by studying their X-ray emissions and other forms of high-energy radiation from space.

April 12, 1981 — A new era in space flight begins when Marshall-developed propulsion systems unleash almost 6 million pounds of thrust to launch America's first Space Shuttle.

Nov. 28, 1983 — The first Spacelab mission is launched aboard the Space Shuttle.

Spacelab is a modular scientific laboratory designed to fit inside the Shuttle's cargo bay, providing a "shirtsleeve" workplace for astronaut-scientists. Marshall played a key role in Spacelab development, operations and management. The mission in 1983 marked the first of more than 20 Spacelab missions during the 1980s and 1990s.

Jan. 28, 1986 — The Challenger accident results in the loss of a Space Shuttle orbiter and its crew of seven astronauts. NASA and the Marshall Center commit to an intense Space Shuttle redesign effort that returns the fleet to flight in 1988.

April 24, 1990 — The Hubble Space Telescope developed by the Marshall Center and intended to open a new era in astronomy is carried into orbit by the Space Shuttle. Not long after launch, however, scientists detect an optical distortion resulting from an incorrectly shaped mirror. To correct the problem, NASA launches a highly successful repair mission in 1993. In addition, servicing missions in 1997 and 1999 maintain NASA's optical space observatory at full capability.

Dec. 4, 1998 — The first U.S. International Space Station element — the Unity connecting node, built by the Boeing Company at Marshall — is launched aboard the Space Shuttle.

July 1999 — NASA launches Chandra, the world's most powerful X-ray telescope — packed with the strength and accuracy to read a newspaper from one-half mile away or see the letters of a stop sign from 12 miles. Chandra, developed by the Marshall Center, is identifying never-before-seen astronomical phenomena and is leading researchers toward a better understanding of the structure and evolution of the universe.

Gene Cernan will speak at Center's 40th anniversary

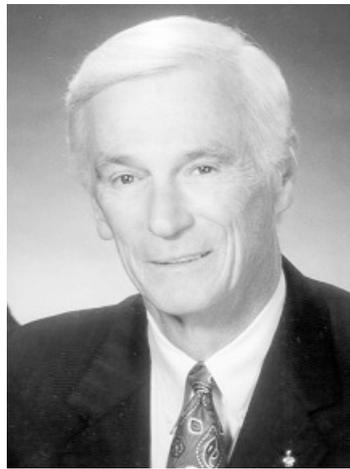
Apollo 17 astronaut Gene Cernan will speak during a tribute to Gen. George C. Marshall at 9 a.m. Sept. 21 in Morris Auditorium. The tribute is part of Marshall's anniversary celebration.

The astronaut visited the Center in February 1973 following the Apollo 17 lunar landing mission. "We rode on the shoulders of giants," Cernan then told employees, referring to the Center's work in building the massive Saturn V Moon rocket. The Apollo 17 moon mission was the last time humans landed on the Moon.

Apollo 17 astronauts also used a Marshall-developed Lunar Roving Vehicle or moon buggy to travel on the Moon.

Following his remarks on Sept. 21, Cernan will sign copies of his latest book, "The Last Man on the Moon."

Cernan was pilot on Gemini 9 in 1966 and lunar module pilot on Apollo 10 in 1969. He commanded Apollo 17 in 1972.



Cernan

Events scheduled for the 40th anniversary celebration include:

Tues., Sept. 19 — Centerwide TV

- Gen. George C. Marshall video

Wed., Sept. 20, 10 a.m. — Morris Auditorium

- Marshall 40th anniversary video premieres

Thurs., Sept. 21, 9 a.m. — Morris Auditorium

- Tribute to Gen. George C. Marshall with music by the 283rd U.S. Army Band from Ft. Benning, Ga.
- 40th Anniversary remarks by Cernan
- Tina Swindell, solo "A Time for Courage"

10 a.m. — Lobby of Bldg. 4200

- Book signing by Gene Cernan

10:30 a.m. — Morris Auditorium

- Forum: "Four Decades in Perspectives; the Future in Focus" with Marshall Center Director Art Stephenson, Deputy Director Carolyn Griner, former Center directors Dr. William R. Lucas and Jack Lee, and retired Associate Director Technical, Bob Schwinghamer

11:30 a.m.-1 p.m. — Bldg. 4200 Quad

- Lunch and entertainment by the 283rd U.S. Army Band

1-1:30 p.m. — Bldg. 4200 Quad

- Time Capsule Ceremony. Center Director Art Stephenson will speak and officially seal the time capsule.

1:30-2:30 p.m., Bldg. 4200 Quad

- 40th anniversary cake with music by Latin Rhythms band

Celebration lunch tickets on sale through Sept. 14

Lunch will be served from 11:30 a.m.-1 p.m. Sept. 21 at the Bldg. 4200 quad.

There is no charge to attend any 40th anniversary celebration activity. However, those planning to attend the lunch may wish to purchase a meal ticket at \$2 each, for a choice of barbecue sandwich or garden salad. The meal also will include a cookie, chips and drink. Ticket purchasers will receive a 40th anniversary souvenir mug with their meal.

Tickets are available through Sept. 14 from administrative officers and at the NASA Exchange in Bldg. 4752.

Time capsule will capture Center's first 40 years for future Marshall generations

Scientists have yet to discover how humans can travel forward in time. However, employees at the Marshall Center have a unique opportunity to make sure future generations know more about what it was like to be part of the Marshall team in the year 2000.

On Sept. 21, Center Director Art Stephenson will host a ceremony to place a 40th anniversary time capsule in the courtyard behind Bldg. 4200. The capsule will be designated for opening in 2035, the Center's 75th anniversary.

Representatives from various organizations are gathering items that reflect the Center's overall contributions to the nation's space program, and that Marshall organizations have made over the last 40 years.

Marshall Center employees are invited to participate in the 40th Anniversary Time

Capsule project. Employees can use a form posted on "Inside Marshall" to record their thoughts on what it means to be part of the Marshall team in the Year 2000. They also may record thoughts about their work on major projects during their career at the Center. The 40th anniversary committee will compile the records for placement in the time capsule.

Participating employees will receive a special certificate to remind future generations to remain alert when the Center announces plans to open the time capsule at its 75th Anniversary.

Employees should go to "Inside Marshall" and follow the prompts to participate. They also should watch for details in the Marshall Star on how to receive their special time capsule certificate.

The Web site will close Sept. 18.



Photo by Bill Ingalls, NASA Photo Department

Professionals graduate

Dr. Fayssal Safie, left, of Marshall's Safety, Reliability and Assurance Department, and B. Alan Harmon, right, of Marshall's Space Science Department, recently graduated from the Professional Development Program at NASA Headquarters in Washington, D.C. NASA Administrator Dan Goldin, center, attended the graduation ceremony.

Students

Continued from page 1

them biochemistry and show them how our first permanent outpost in space can be used for research," said Dr. Alex McPherson, head investigator for the experiment and a biochemistry professor at the University of California in Irvine.

The students — working in university laboratories with McPherson and other scientists from NASA's Microgravity Research Program at the Marshall Center — mixed biological solutions and sealed the chemicals in small tubes or pipettes. The samples were frozen to -320 degrees Fahrenheit (-196 degrees Celsius or 77.3 degrees Kelvin).

Just before the Shuttle launch, scientists will place the samples in the Enhanced Gaseous Nitrogen Dewar — a vacuum-jacketed container, similar to a large thermos bottle, with an absorbent inner liner saturated with liquid nitrogen. Once in orbit, the liquid nitrogen will boil off inside the unpowered, unattended thermal enclosure, and the samples will thaw.

Before thawing is complete, the crew will move the dewar to the Space Station where crystals will slowly form for several weeks. When the Shuttle returns to the Station in October, the dewar will be brought back to Earth where scientists will retrieve and analyze the crystals to determine the structure of biological molecules.

"There are many ways to grow crystals," said McPherson. "The dewar allows us to fly hundreds of samples at once, so we can look at a variety of conditions and determine which ones produce the best crystals." McPherson has been a leader of NASA-sponsored crystallization projects since 1984 and received

NASA's Exceptional Scientific Achievement Medal in 1999. He has published numerous journal articles describing crystals grown on the Space Shuttle and the Russian space station Mir.

This experiment sets the stage for more complex structural biology experiments to be flown in the U.S. Laboratory Destiny when it is attached to the Space Station early next year.

"The Space Station is a unique space laboratory where we will be able to perform experiments for longer periods, in sophisticated facilities and under conditions that are more controlled," said Ron Porter, manager of the Biotechnology Program at the Marshall Center. "We are pleased students, who will be the scientists and engineers of the future, were able to have a hands-on role in this first experiment."

The students and teachers who helped prepare flight samples are from Alabama, California, Florida and Tennessee. Students and teachers from 20 other states attended classes as part of the pilot education program sponsored by the Marshall Center — NASA's Lead Center for Microgravity Research, the University of California in Irvine, the University of Alabama in Huntsville, Alabama A&M University, the Alabama Space Grant Consortium, the Florida Space Grant Consortium, the BellSouth Pioneers, and Alabama Science in Motion — a special science program of the Alabama State Department of Education.

Students and teachers from Alabama, Florida and Tennessee will attend the September launch of the Space Shuttle at the Kennedy Space Center in Florida.

The writer, employed by ASRI, supports the Media Relations Department.

Companies

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for launch Friday to the International Space Station.

“NASA’s suppliers and their products are an integral part of the Space Shuttle program,” said Michael Rudolphi, manager of the Marshall Center’s Reusable Solid Rocket Motor Project Office.

“Every individual at these companies who supports and contributes to the production and delivery of the Reusable Solid Rocket Motor is a valued member of our NASA team.

“In saluting these companies,” Rudolphi said, “we want to remind our partners that they should be tremendously proud of their key role in the Shuttle launch system and proud of the many contributions to humanity derived from Shuttle missions.

“Their diligent attention to detail and strict process controls are directly critical to its safe and reliable performance — and to preserving the safety of the brave men and women of the astronaut corps. We want to say ‘Thanks’ for being a member of the world’s greatest human space flight team.”

The Marshall Center is NASA’s premier organization for development of space transportation and propulsion systems. Marshall manages the propulsion systems for the Space Shuttle, which include the main engines, the external fuel tank, reusable solid rocket motors and solid rocket boosters.

The writer, employed by ASRI, supports the Media Relations Department.

NASA recognizes contractor partners

The following companies were recognized for their contribution to the Reusable Solid Rocket Motors.

- 3M
- Accurate Energetic
- ACETO
- Acrymax Technologies
- Aircraft Missile Parts
- Airtech International
- AKROS Chemical
- ALATEC
- ALCOA
- All Felt Products
- American Polytherm
- AMPAC
- Amphenol
- Arcturus Manufacturing
- ASRC
- BEMSCO
- Blaisdell Shims
- Borden Chemical
- Bron
- Brulin
- Burke Industries
- Cal Doran
- Carr Lane
- Central Valley
- Certified Fabricators
- Chemlabs
- Ciba-Geigy
- Conoco
- Cook Composites
- Courtaulds Aerospace
- Cytec Fiberite
- Dali Distributing
- Daniels Manufacturing
- Deft
- Dexter Adhesives
- Dexter Crown Metro
- Dodge Regupol
- Dow Chemical
- Dow Corning
- E.I. Dupont
- Eagle Elatomers
- Electrical Insulation
- Elementis Pigments
- Emerson & Cuming
- Emhart Fasteners
- Ensign Bickford
- Enviro Tech
- Fastener Technology
- Freudenberg Nok
- GE
- Glenair
- Harwich Chemical
- Highland Industries
- Hitco
- Hummel Croton Inc.
- INCON
- Independent Ink
- International Aero Hardware
- International Seal
- Irvin Industries
- Jamestown Paint
- Jardine Petro
- Jemco
- JM Asbestos
- Kayco Corp.
- Keystone Engineering
- Kirkhill Rubber Co.
- Krayden
- Kyzen Corp.
- Ladish
- Laird Plastic
- Lord Corp.
- Measurement Group
- Moeller Manufacturing
- Morrells
- MS Aerospace
- Nalco Chemical
- NAZ-DAR
- Pacific Coast Chemical
- Parker Hannifin O-Ring
- Parker Hannifin O-Seal
- Polycarbon
- PRC Desotto
- PT Technologies
- Regional Supply
- Reinhold
- Resin Technologies
- Rheox Inc.
- Robrad
- Rhom & O Haas
- Rosemount Aerospace
- Rust-Oleum Corp.
- Safety Components
- Sava Industries
- Sherwin Williams
- SPS Technologies
- Stadco
- Stellar Technology
- Stockwell Rubber
- Synthetic Thread Co.
- Tayco Engineering
- TC Specialties
- Technology Marketing
- TJ Products
- Toyal America
- TRA-CON
- Tridox Products
- Unitech Composites
- United Precision
- Vacco Industries
- Vantico
- Voss Aerospace
- Votaw
- Wedco Technology

Obituaries

Clarke, William A., 72, of Huntsville, died Aug. 16. He retired from Marshall in 1983 where he worked as an AST, flight mechanic. He is survived by his wife, Rebekah Clarke.

Ettingoff, Nathaniel V., 80, of Huntsville, died Aug. 15. He retired from Marshall in 1972 where he worked as an AST, technical management.

Sexton, Frank J., 72, of Madison, died Aug. 15. He retired from Marshall in 1981 where he worked as an engineering technician. He is survived by his wife, Mabel Sexton.

Price, Jesse C., 88, of Huntsville, died July 29. He retired from Marshall in 1974 where he worked as an aerospace engineer supervisor. He is survived by his wife, Edith W. Price.

Evans, Phineas D., 64, of Huntsville, died July 25. He retired from Marshall in 1996 where he worked as an AST, optical physics.

Stone, Donald, 68, of Huntsville, died July 22. He retired from Marshall in 1989 where he worked as an AST, electronics engineer. He is survived by his wife, Josephine Stone.

M2P2

Continued from page 2

closed,” he explained. “At the right pressure, the charged gas that we are using to fill the magnetic field collides with the gas left in the chamber to create light so we can see where the plasma we are creating is going. We’ll be able to see it until the intensity of the light gets too low for our cameras.

“We believe that we have seen the field line expand with increasing pressure from the inside,” Gallagher said. After analyzing and quantifying the first sessions test results, the second session of tests will begin.

“This is a concept for propulsion that appears to offer a practical method of propelling objects, such as manmade satellites, into the outer solar system quickly,” Gallagher said. “It’s low fuel consumption, but is capable of achieving high speeds. The propulsion is low level, but continuous — not the sudden, powerful force of a Saturn rocket,

although it still has to get to space onboard a rocket.”

Each technique has advantages and disadvantages. M2P2’s advantage is that it uses current engineering techniques — nothing else has to be invented.

“This concept also has the potential to not only provide a source of propulsion for deep space missions, but also a way to protect astronauts from harmful particle radiation, which is caused by a solar flare. The extended magnetic field is expected to shield particular regions inside the magnetic structure from these dangerous particles,” he said.

“This is something that can take science experiments and possibly people to the outer planets in our solar system,” Gallagher said.

The writer, employed by ASRI, is the Marshall Star editor.

Employee Ads

Miscellaneous

- ★ Oriental brass and beveled glass dining table, 71"x39"x29", \$475. 355-3089
- ★ Auburn and Northern Illinois football tickets, Sept. 23, two tickets, \$20 ea. 722-9114
- ★ Flying Models magazine, 10 copies, dating 1968-1975, make offer; auto grease gun w/ lithium refill, \$3.50. 881-8648
- ★ Heavy-duty post hole digger, 9" diameter auger, Bush Hog brand, \$160. 772-3400
- ★ Nokia 252 cell phones, 2 each, one w/belt case, instruction and accessories guides, \$10 ea. or \$18 for both. 574-7686/772-6860
- ★ Double bed, \$75; Kenmore washer, \$75; dryer, \$35. 461-4061
- ★ Contour hospital bed, no rails, \$600. 858-9156
- ★ Conn alto saxophone w/hard case, \$600. 864-0221
- ★ Refrigerator w/top freezer, about 18 cu. ft., \$100. 653-0798
- ★ GRE prep books, 1999 and 2000. 539-0123
- ★ Smith Corona notebook word processor w/ spreadsheet, Daisy wheel printer, \$80. 895-6722
- ★ Kenmore microwave, 1400W, 1.4 cu. ft., clean, temperature probe, removable shelf, \$80. 895-6722
- ★ Black & Decker, circular saw, 2,5HP, 7 1/4", \$40; Black & Decker, electric air pump, \$40. 895-6722
- ★ New queen size, silver metal bed, \$850. 971-0292
- ★ Motorola cellular flip phone, extra batteries, chargers, case, \$45; roll-away tool chest, tools, \$100. 852-6952
- ★ Honda 750 VTC Ace 2000, chromed, 4K miles, red/black, five-speed, windshield, \$5,000. 859-0501
- ★ Solid oak child's desk w/hutch, \$100; Century toddler car seat, \$20. 533-5942
- ★ Craftsman 10" table saw w/stand and all accessories, \$75. 726-0243
- ★ Kenmore refrigerator, 22 cu. ft., side by side, water/ice in-door, tan, \$200. 726-0243
- ★ Toddler bed, \$20; oak crib w/mattress,

- \$120. 837-6274/leave message
- ★ Canon T50 camera w/flash including wide angle and zoom 75-200 lenses, \$125. 232-8311
- ★ Compound bow, PSE lightening flight, camo case, many accessories, 70 lb. pull, 30" draw, \$200. 757-0320/517-0657 pager
- ★ 1997 Sea-Doo GTI, 3-seater, trailer, cover, \$5,000. 256-586-7797
- ★ Toddler girl's bike w/training wheels, \$25; Little Tykes table w/2 chairs, \$20. 464-5394
- ★ Bayliner 2550, with trailer and boat house with lift, at Whitesburg Boat and Yacht Club, \$20,000. 539-5058
- ★ Lawn mower, 22-inch cut, 5 HP, big wheel, \$30. 881-3115
- ★ Fastrack walking exerciser, \$25. King-sized mechanics' creeper with 6 rollers, \$25. 883-2653
- ★ 1989 SeaRay Seville, 21 ft. mid cabin cruiser, sleeps 4, head, galley, full canvas, 4.3L engine, \$10,000. 880-6441
- ★ Bama football tickets. Vandy (4), Southern Miss (2) and Central Florida (4). \$40 each. 830-4304

Vehicles

- ★ 1977 Porsche 924, 4-spd, sunroof, 147K miles, \$2,000 or make offer. 828-6213
- ★ 1996 Dodge Intrepid ES, 3.5L, V-6, 62K miles, black w/gray interior, CD, integrated child seat, keyless entry, \$7,900. 882-7350
- ★ 1994 Nissan Sentra, 96K miles, automatic, 4-door, am/fm tape, a/c, \$3,750 obo. 464-0660
- ★ 1991 Plymouth Voyager minivan, 166K miles, AM/FM/CD player, \$1,200. 880-6267
- ★ 1992 Acura Integra, red, 2-door hatchback, 5-speed, sunroof, a/c, pw, am/fm cassette, cruise, \$5,400. 764-2492
- ★ 1995 Corolla DX, one-owner, power windows/doors, CD, keyless entry, \$6,200. 722-2190
- ★ 1991 Chevy Suburban, 4-captains chairs plus bench seat, TV, green/tan, 141K miles, \$5,000 obo. 852-5554
- ★ 1993 Dodge Grand Caravan SE, one-owner, many new parts, service records available, \$5,700 obo. 895-9520

- ★ 1989 Cadillac DeVille, silver, automatic, a/c, all-power, am/fm/tape, leather, 205K miles, \$4,100. 931-433-0004
- ★ 1972 GMC pickup truck, 350, V-8, PB/PS, air. 881-9421
- ★ 1989 Blazer S-10, 165K miles, white, 2-door, V-6, air, automatic, moon roof, \$2,350. 883-8947
- ★ 1950 MGTD, blue, restored, including engine and transmission, \$10,000. 881-7953
- ★ 1996 Ford Windstar LX, white/gold, tan leather, captain chairs, dual air, 98K miles, \$10,000. 534-7981
- ★ 1995 Lincoln Mark VIII, white w/tan leather interior, \$12,000 obo. 858-9682
- ★ 1992 Chevy S-10 Blazer, 2WD, auto, V-6, 143K miles, one-owner, all power, a/c, am/fm/CD, burgundy, \$3,000 obo. 461-8077
- ★ 1996 Dodge Dakota Sport pickup, one-owner, white, 57K miles, air, auto, am/fm stereo tape, \$6,700 obo. 256-586-4542

Found

- ★ Magnetic key holder w/keys. Call 544-4758 to identify
- ★ Money, around Bldg. 4200 area. Call 544-4758 to identify/claim
- ★ Gold bracelet in Bldg. 4200 North parking lot. Call 544-4758 to identify

Wanted

- ★ Treadmill. 881-6040
- ★ Thomas the Train kit. 325-6000
- ★ Ride from Hampton Cove through December, flexible hours, will pay. 544-1950/533-2935

Center Announcements

☛ **Foxtrot, Samba Lessons** — The MARS Dance Club is offering foxtrot and samba lessons Sept. 11, 18, 25 and Oct. 2 at St. Stephens Episcopal Church on Whitesburg Drive. Intermediate lessons are from 7-8 p.m.; beginner lessons from 8-9 p.m. Cost is \$6 per person. For more information, call Woody Bombara at 650-0200.

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